



## Case Study

# LoRa Facilities Management Washroom Monitoring



SpringCT partnered with a renowned facilities management company to automate washrooms usage monitoring for timely cleaning and replenishment of supplies. The objective was to provide the best experience for washroom users by always ensuring clean washrooms and availability of toiletries. The employees of a multi-building office complex often complained about bad and unhygienic washroom condition and lack of toiletries like soap. The facility manager wanted to alert the restroom attendant when any particular toilet needed cleaning.

SpringCT, by leveraging its LoRa and LoRaWAN expertise, developed a LoRa powered platform by utilizing ChirpStack network and application servers to track washroom usage efficiently and accurately. By counting the number of times, the washroom door is opened and closed, platform provided real-time data insights required for facility management. This system not only ensured a cleaner and more hygienic washroom environment but also optimized janitorial schedules, reducing operational costs.

## Product Features

- **LoRaWAN Technology**  
Leveraged LoRaWAN's low power consumption and long-range connectivity for efficient monitoring.
- **Centralized Monitoring**  
Consolidated washroom door open counts for five multi-storied buildings in a centralized system.
- **Smart Alerting System**  
Alert restroom attendants to clean a particular washroom based on actual usage patterns.
- **Need-based Cleaning**  
Ensured need-based cleaning to provide best user experience and maintain hygiene standards.
- **Resource Optimization**  
Optimized resource usage by avoiding unnecessary cleaning visits and improving efficiency.

## Key Technical Achievements

- **LoRa Platform Development**  
Designed and implemented a LoRa powered platform by utilizing ChirpStack network and application servers.
- **Scalable Architecture**  
Leveraged LoRaWAN's scalability for easy deployment in large facilities and multi-building complexes.
- **Security & Privacy**  
Ensured secure communication with data integrity and privacy protection for sensitive facility data.

## Technologies Used

- **LoRa & LoRaWAN:** Low-power, long-range wireless communication technology.
- **ChirpStack:** Network and application servers for LoRaWAN infrastructure.
- **AWS:** Cloud infrastructure and services for data processing and storage.

- **Spring MVC:** Java framework for building web applications and REST APIs.
- **Frontend Technologies:** React JS for web interface and Android for mobile applications.

## Results

- Successfully achieved the real time tracking of washroom usage
- Centralized system to track multiple washrooms spread across the campus
- Optimized resource utilization by reducing unnecessary work
- Achieved customer delight by ensuring availability of clean hygienic washrooms
- Improved operational efficiency and reduced maintenance costs

## Conclusion

SpringCT's technical expertise and modular design not only ensured a cleaner and more hygienic washroom environment but also optimized janitorial schedules. With our solution, facility managers could proactively address maintenance needs, enhance user satisfaction and promote efficient resource allocation thereby reducing operational costs.